

AMD
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Phil Hester
Corporate Vice President and
Chief Technology Officer

July 26, 2007

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Computing has evolved





The Future is Now



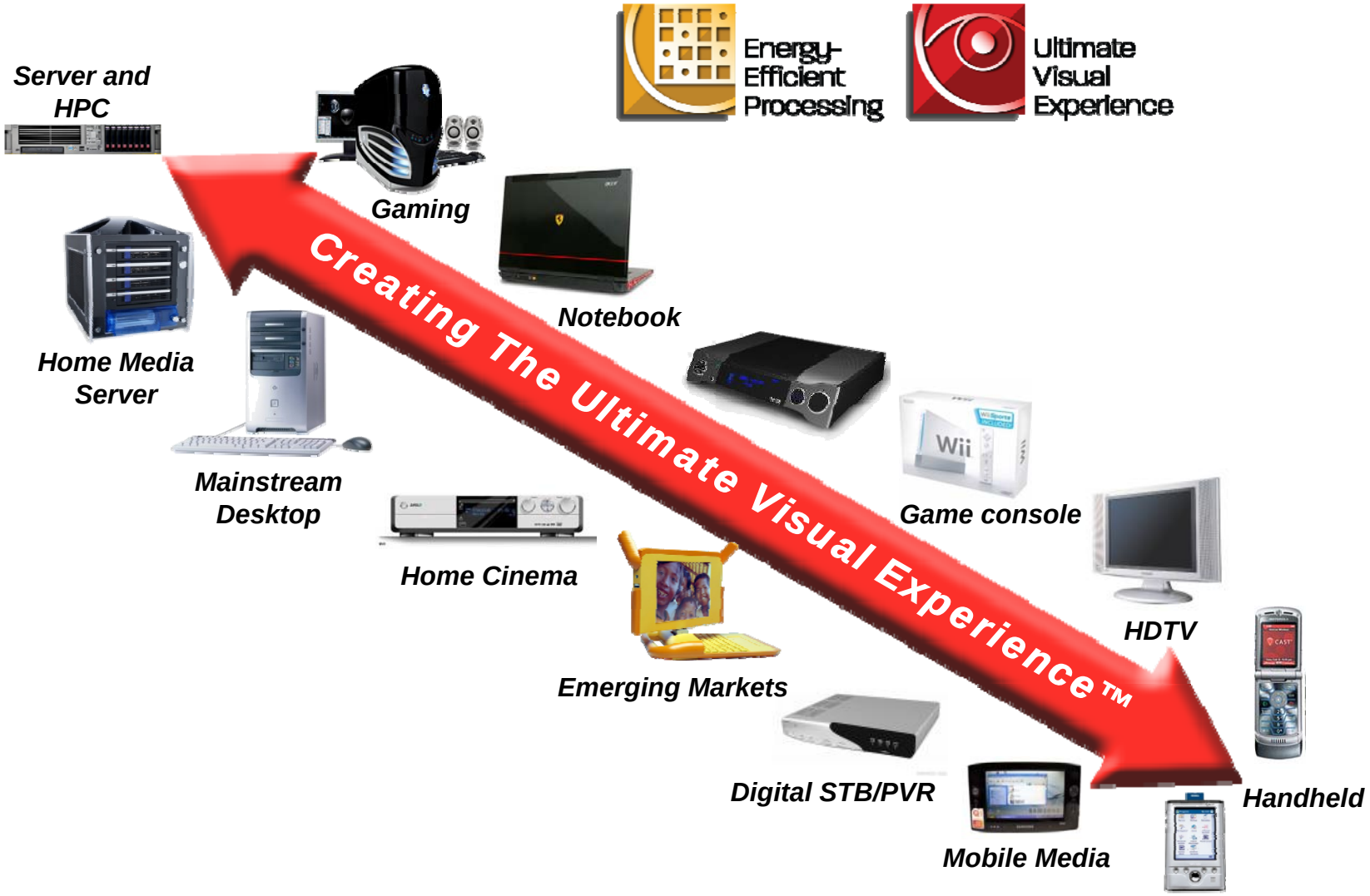


So has AMD

The New Computing Spectrum: All the Screens in Your Life

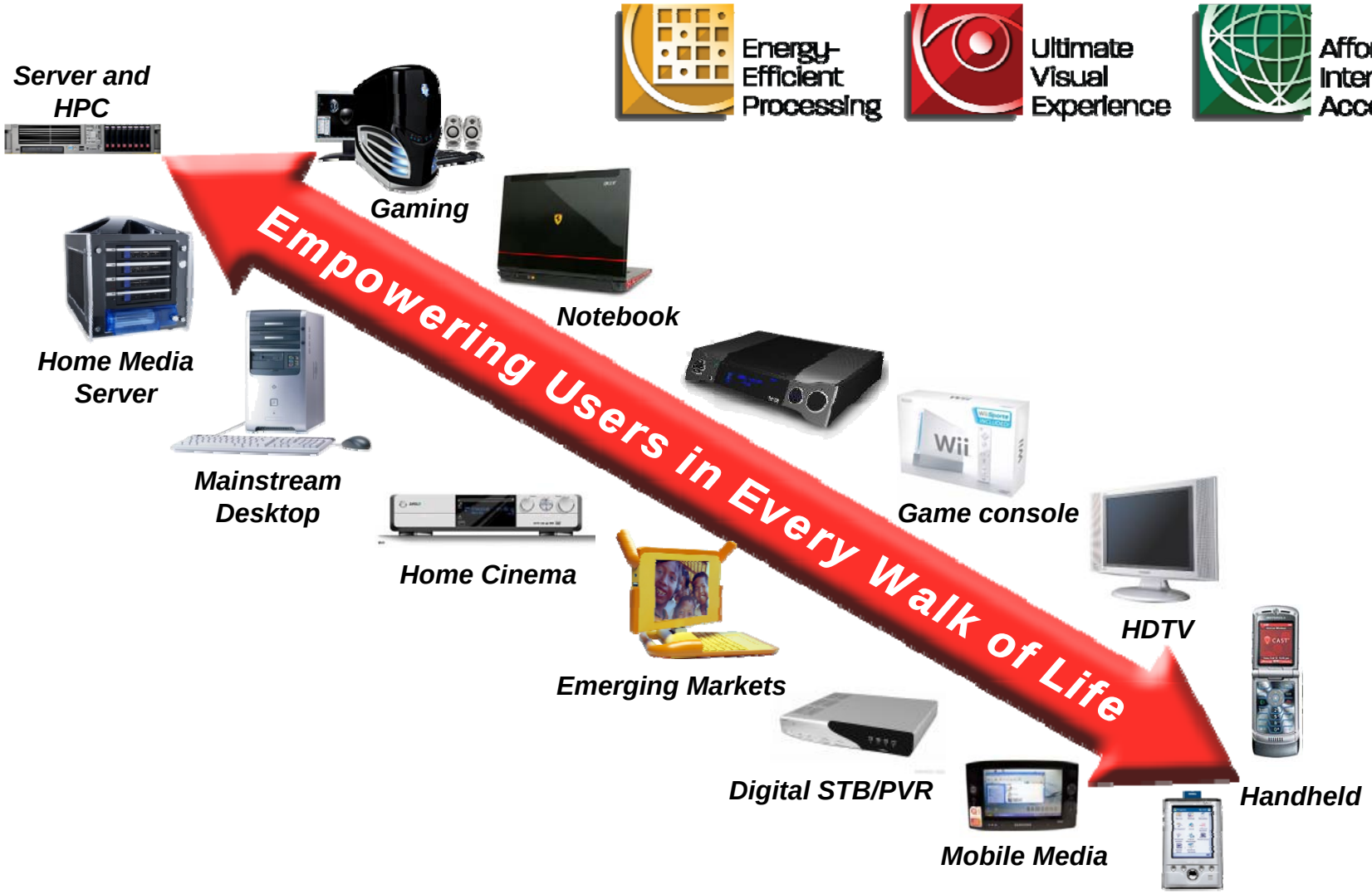


The New Computing Spectrum: All the Screens in Your Life



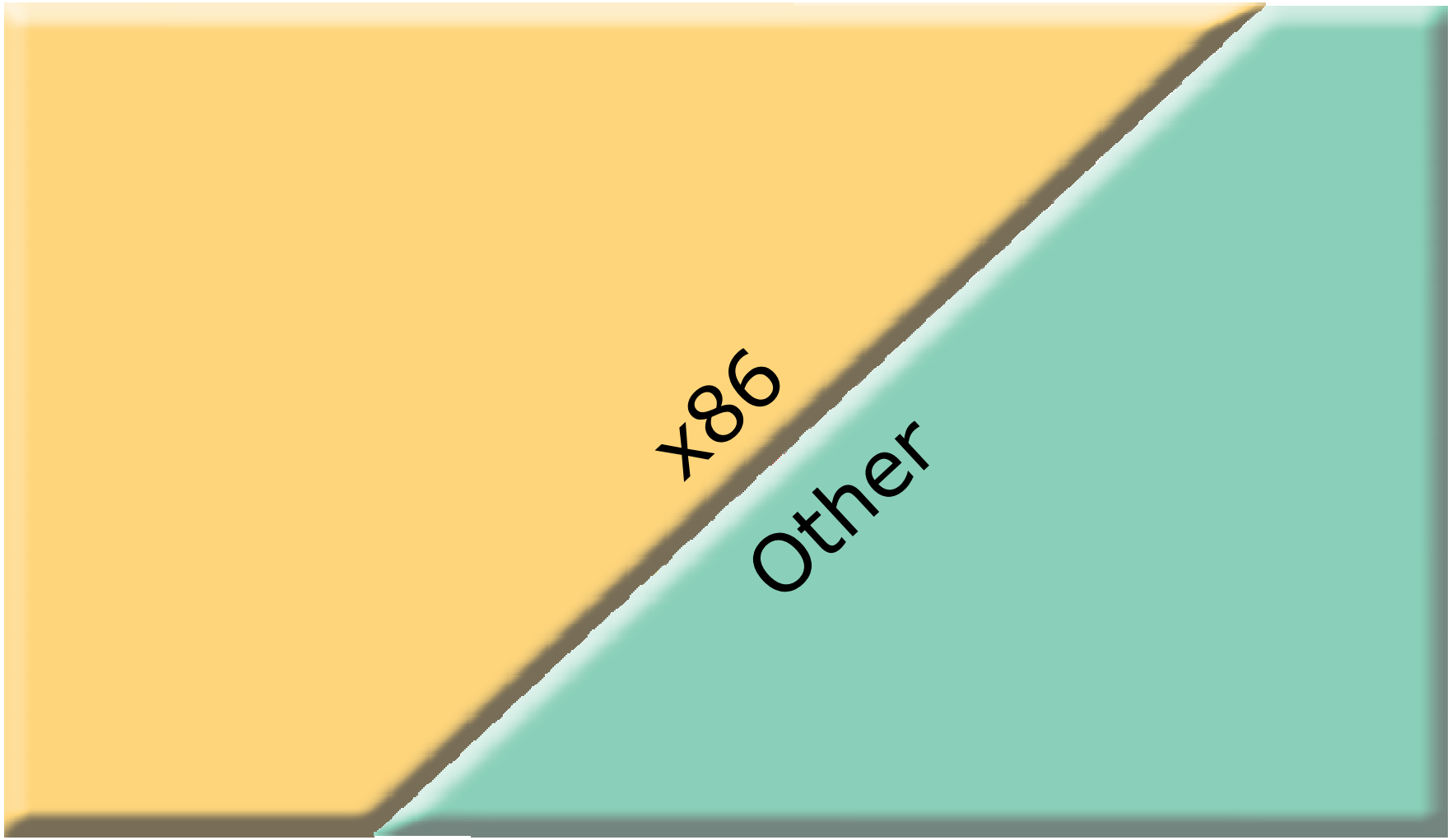
The New Computing Spectrum: All the Screens in Your Life

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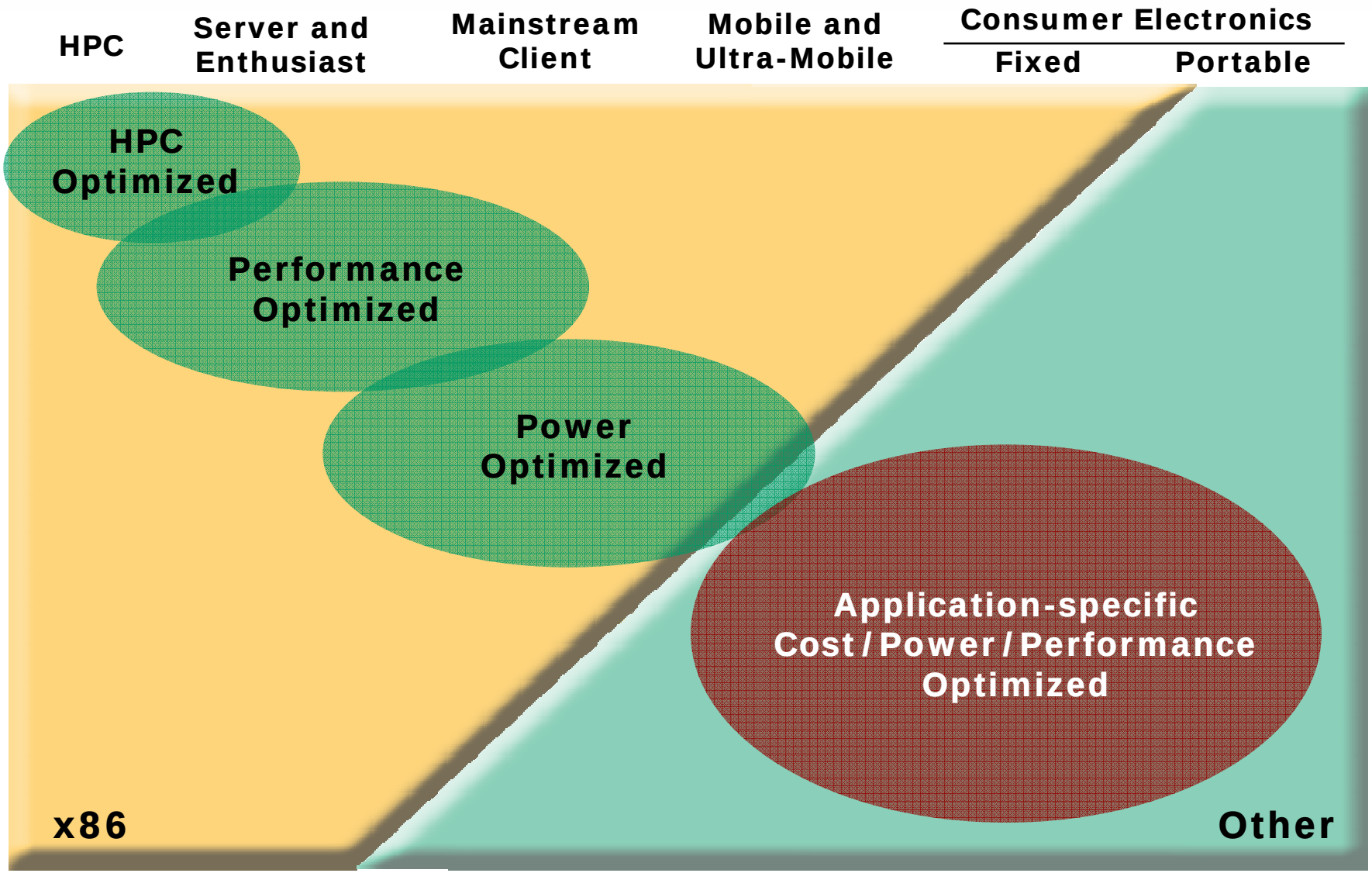


The New Computing Spectrum: All the Screens in Your Life

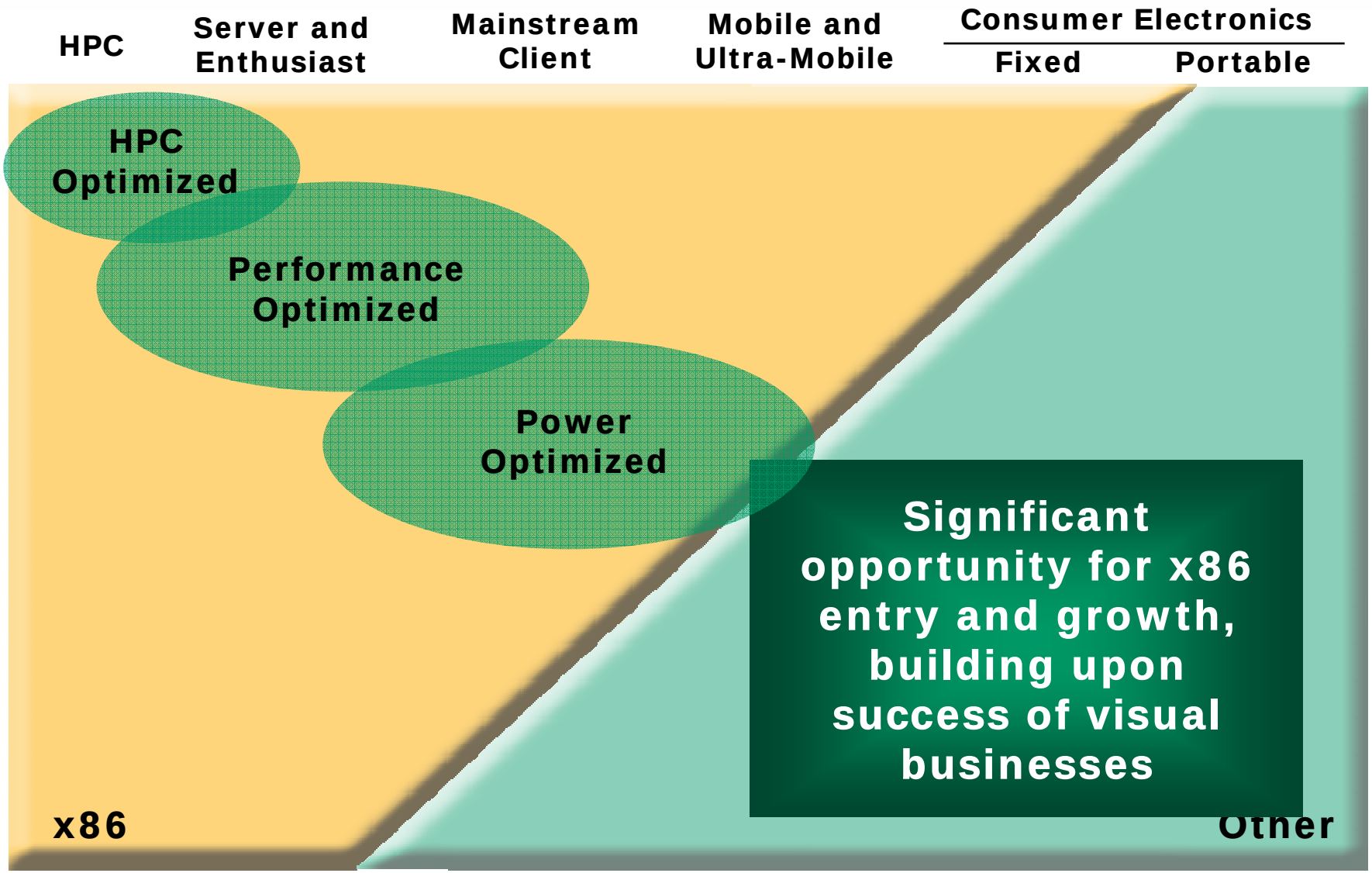
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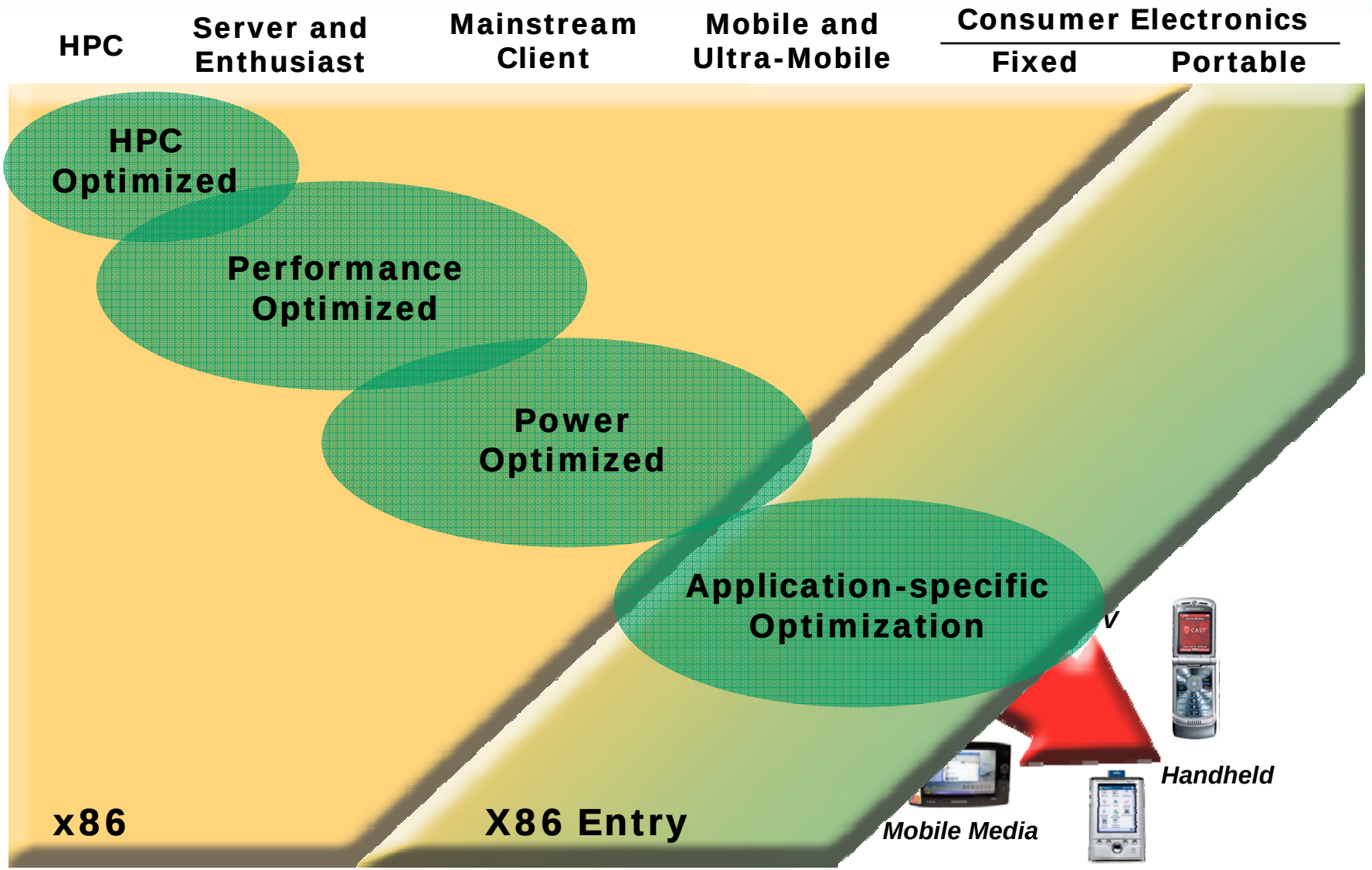
Diversifying Platform Design Tracks



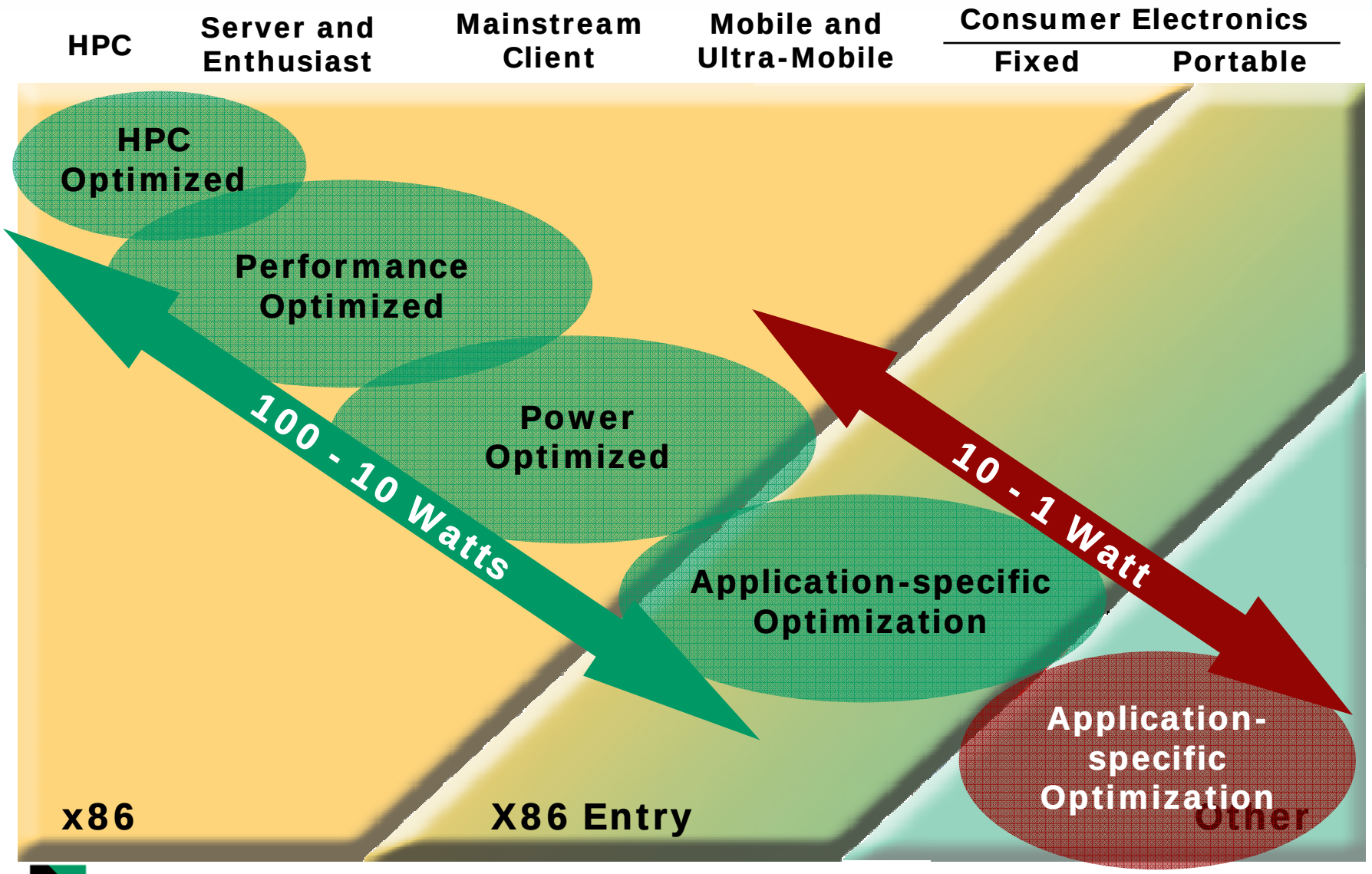
Diversifying Platform Design Tracks



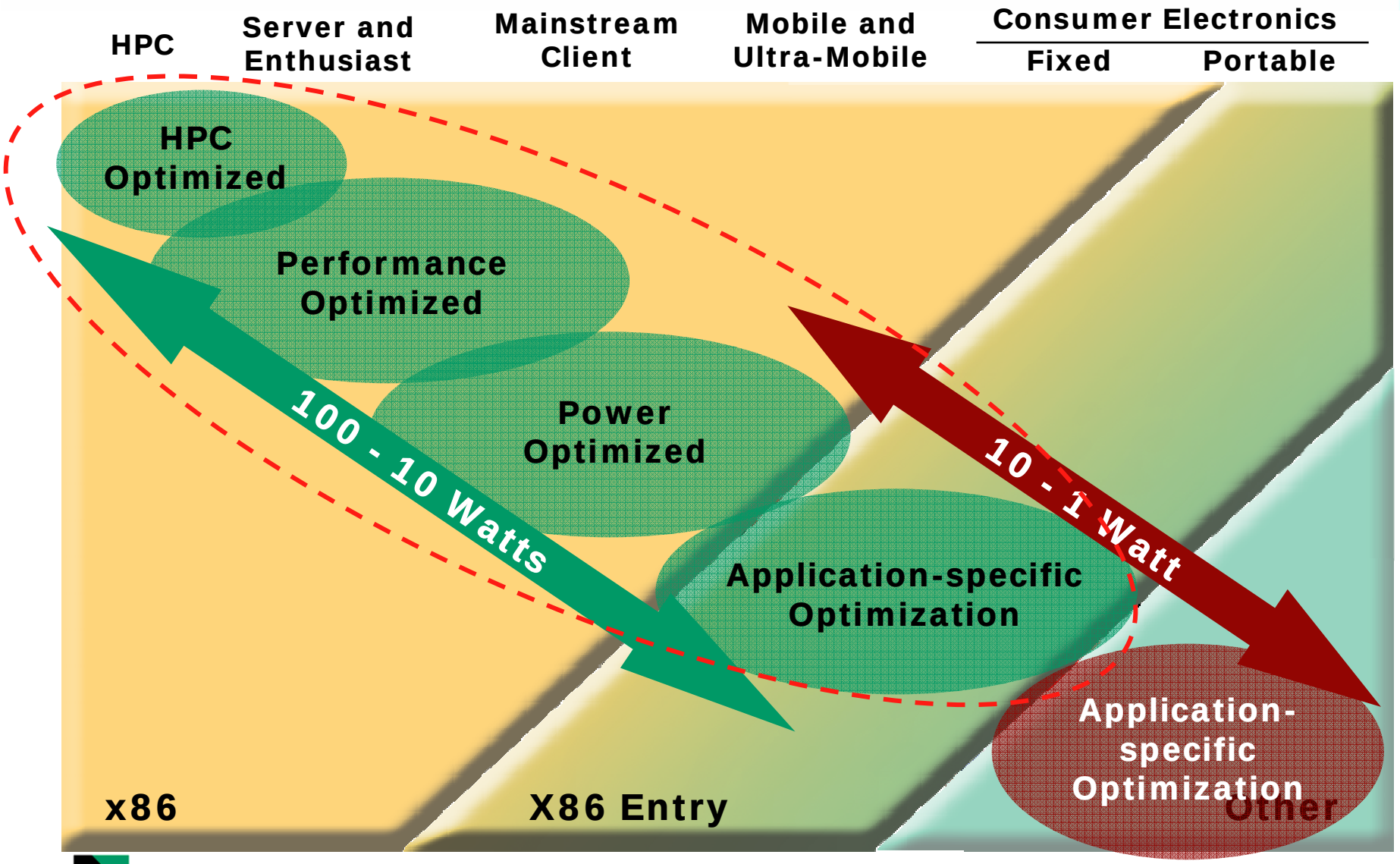
Diversifying Platform Design Tracks



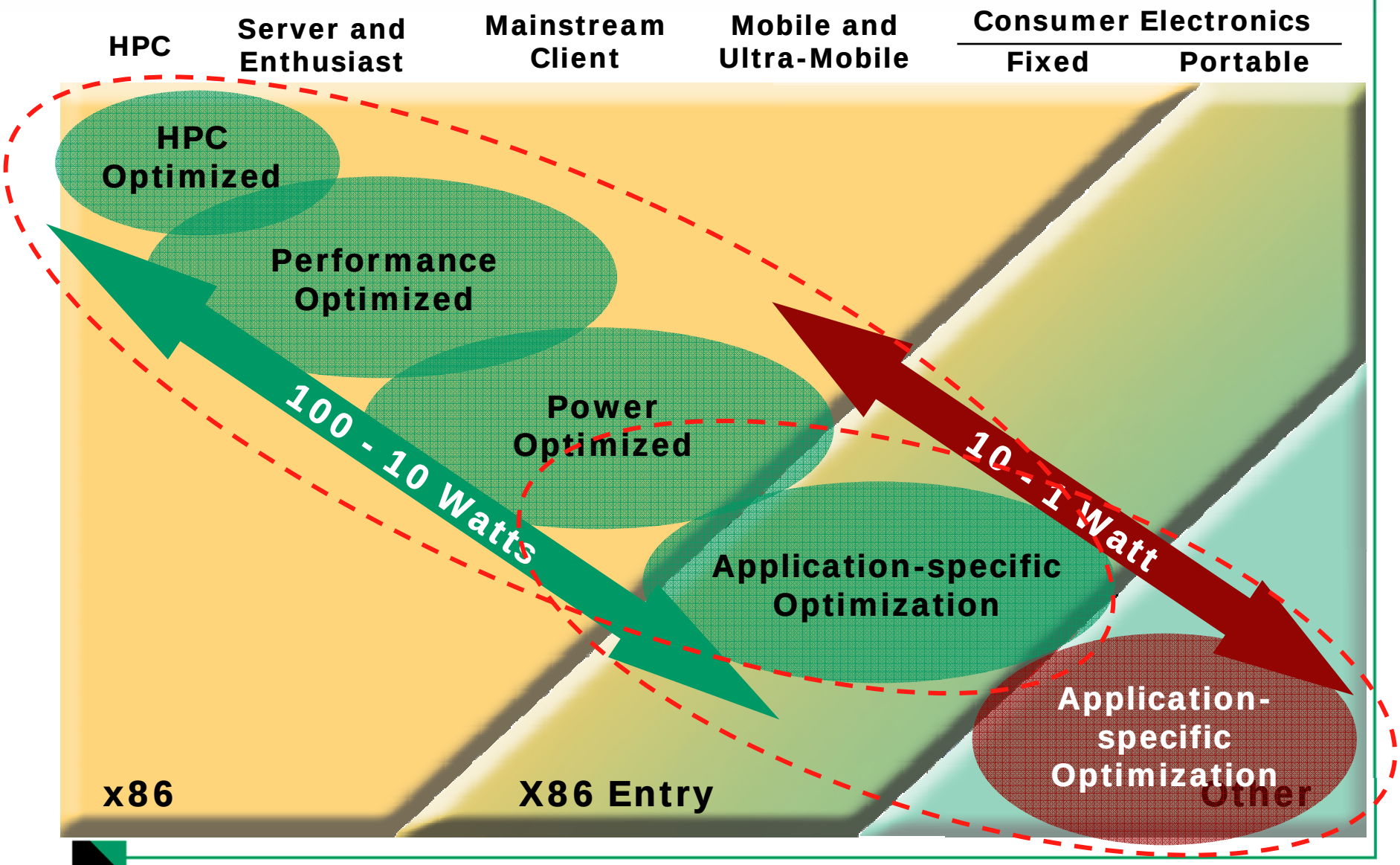
Diversifying Platform Design Tracks



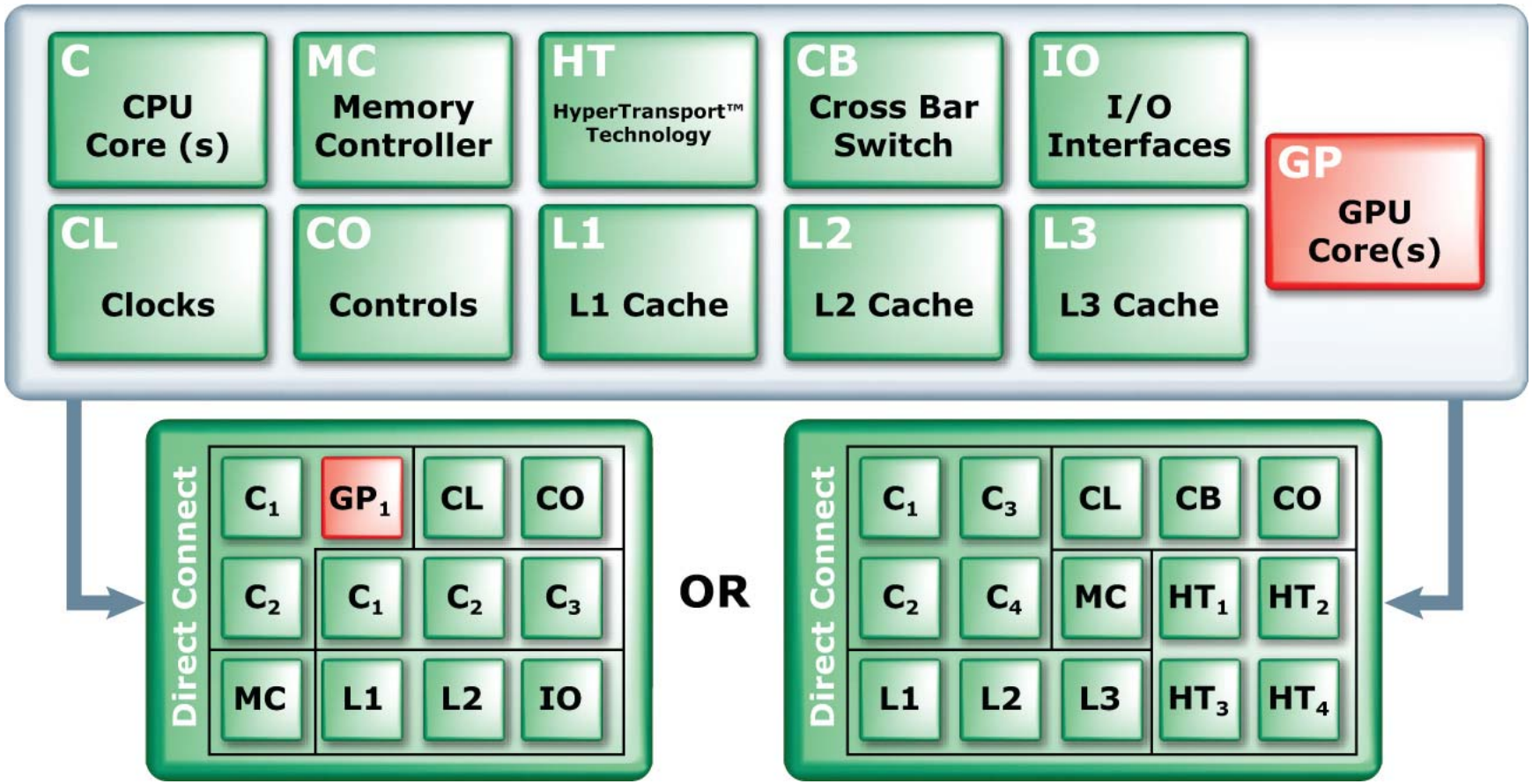
Diversifying Platform Design Tracks



Diversifying Platform Design Tracks

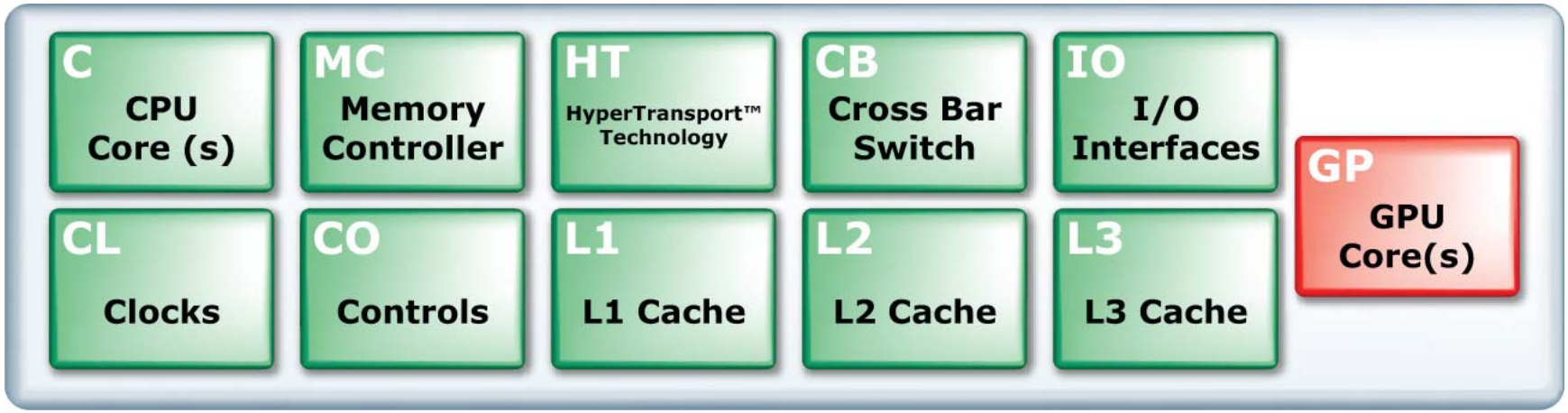


AMD M-SPACE Design Methodology



Modular approach can increase design flexibility and overall business agility

AMD M-SPACE Design Methodology



Modular: Reconfigurable "building blocks" for design speed/agility

Scalable: Linear scaling of multi- and single-thread performance

Portable: Energy-efficiency for increased mobility/portability

Accessible: Ongoing commitment to open innovation

Compatible: Backward compatibility and ease-of-upgrade

Efficient: Optimal on-chip and system level I/O efficiency

Next-Generation Graphics Technologies

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Immersive integrated graphics

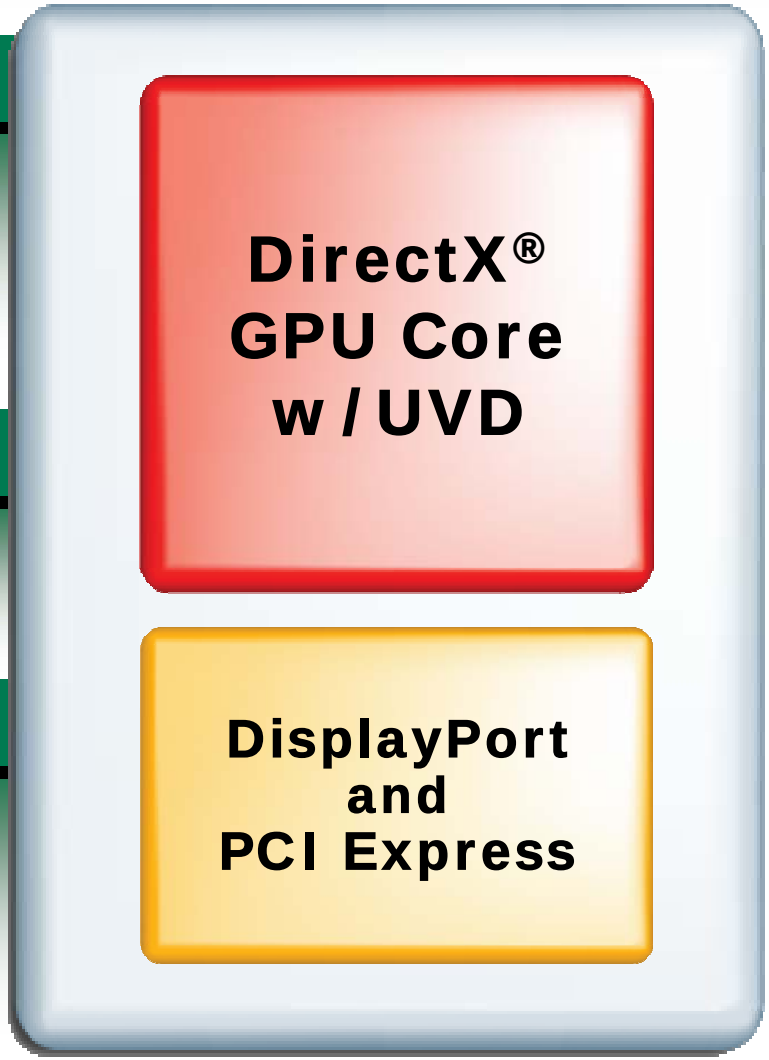
- DirectX® 9, DirectX® 10 and beyond
- 2nd generation UVD
- PCIe Generation 2

Leverages chip-level caches

- Increased performance
- Long battery life

Enhanced connectivity

- DisplayPort
- HDMI/DVI*



** Some models may not have this feature. Please refer to product specs on ATI.AMD.COM*

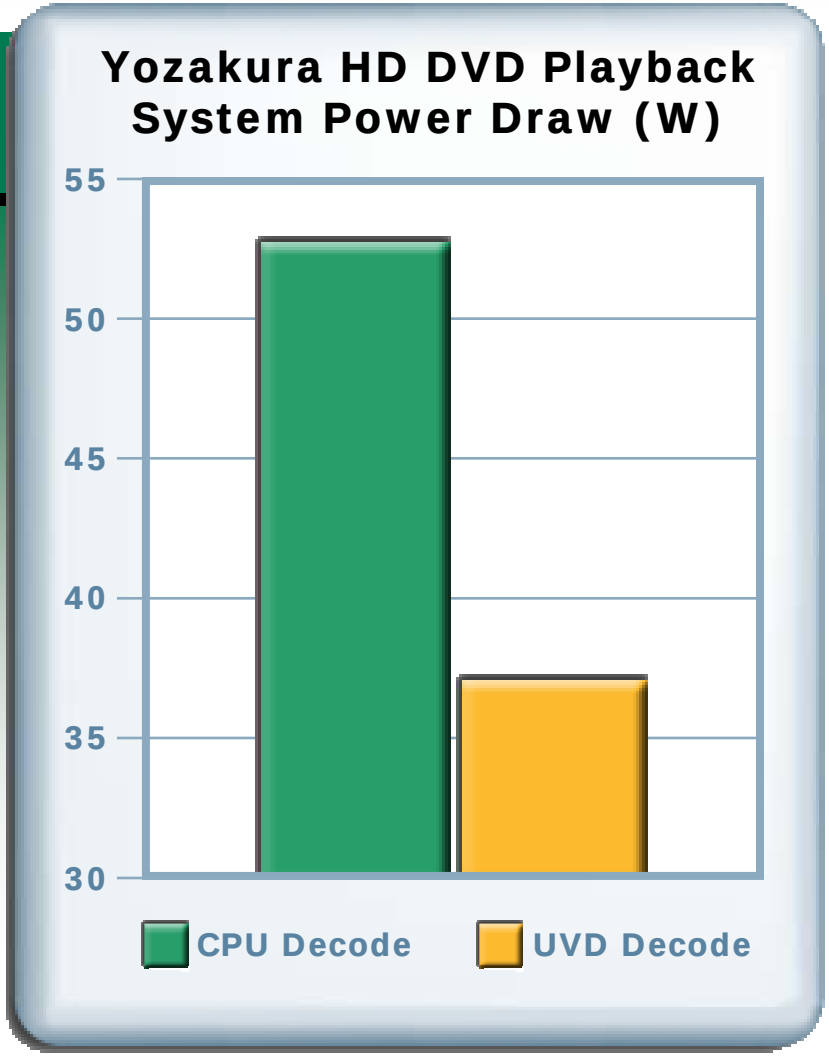
Unified Video Decoder*

Accelerated Computing for the HD World

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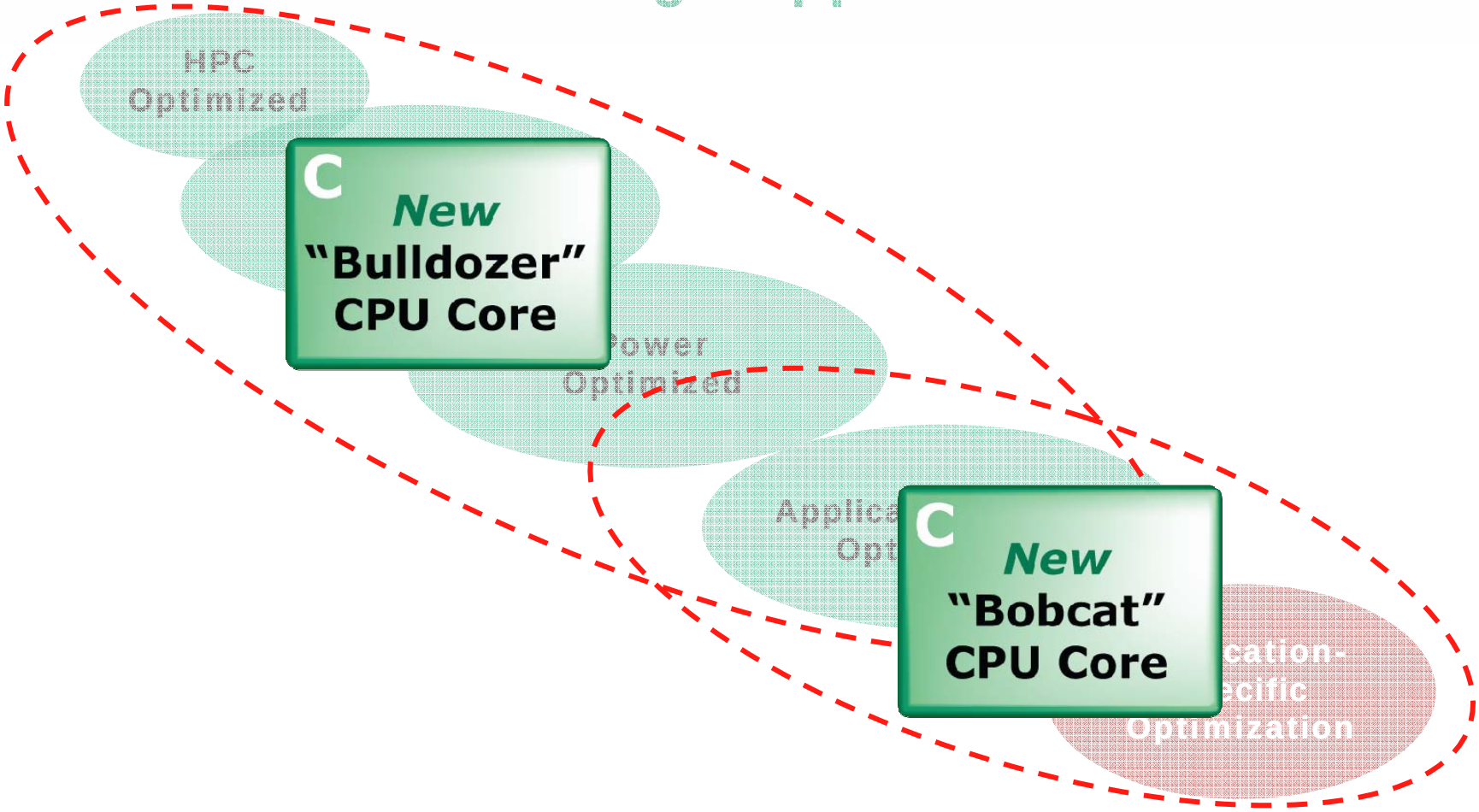
Dedicated video decode processing unit on the GPU

- Dramatically reduces CPU utilization
- Handles the entire decode process
- Offloads from both CPU and GPU rendering pipeline
- More efficient than the CPU for HD decode at a fraction of the size
 - UVD block on HD 2000 series GPU at 65nm – 4.7mm²
 - Dual core desktop CPU at 65nm – 126mm²



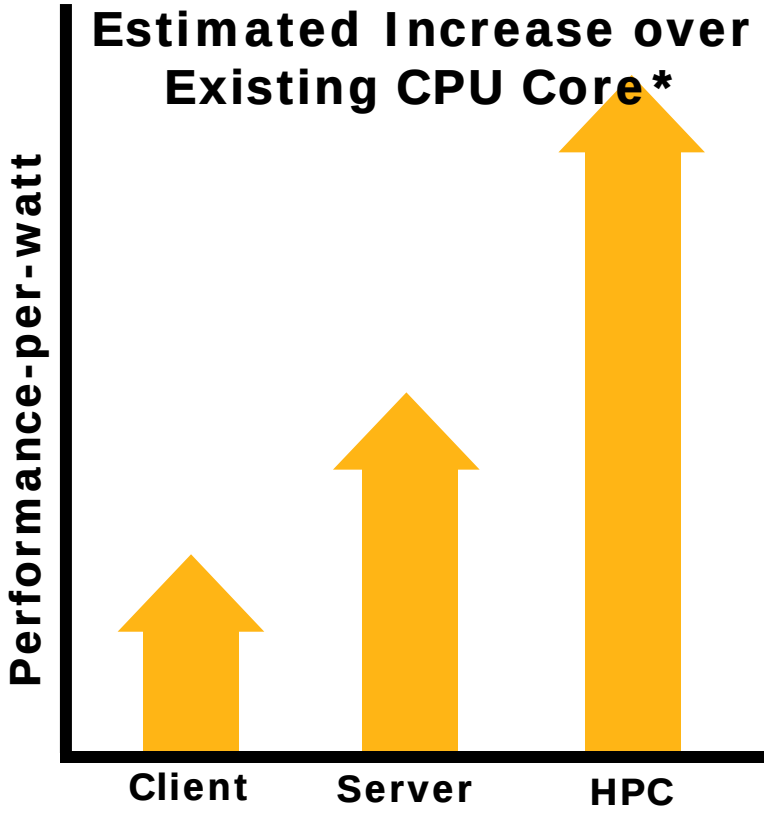
** UVD is not present in all GPUs. Please refer to product specs on ATI.AMD.COM for more information*

AMD's Modular Design Approach



Significant focus on next-generation CPU cores to uniquely address both ends of spectrum

All New "Bulldozer" CPU Core

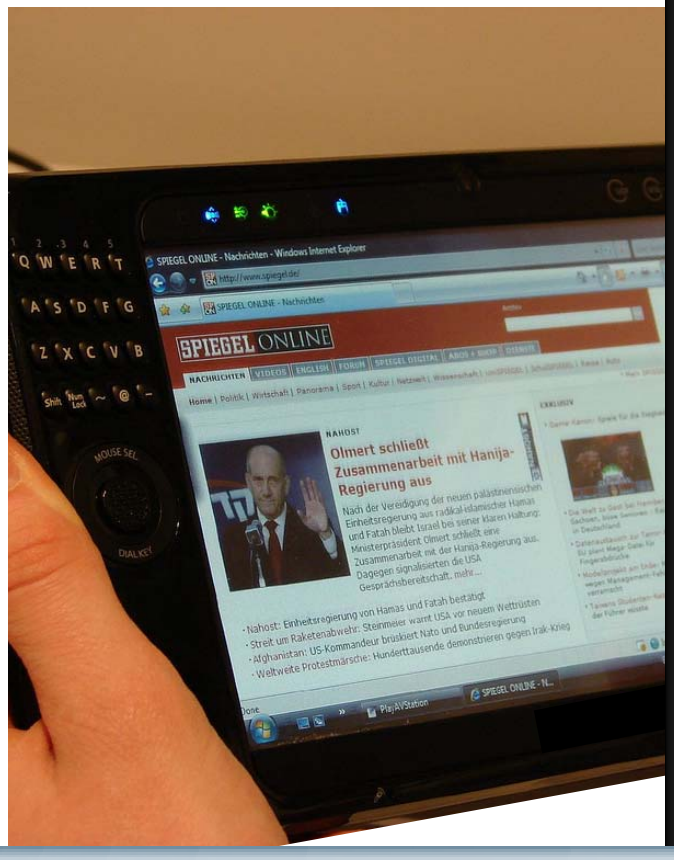


- Targeted at server and client
- Grounds-up core development
- Dramatic increase in throughput-oriented performance/watt
- Continued scaling for single-thread performance
- Partitioned for future scalability and modularity

Designed to be the highest performing single and multi-threaded compute core in history

** AMD estimates based on industry-standard performance modeling*

All New "Bobcat" CPU Core



- Targeted at mobile, ultra-mobile and consumer electronics
- Grounds-up core development
- Step-function increase in energy efficiency
- Designed to scale as low as 1 watt
- Leading performance-per-watt-per-dollar proposition

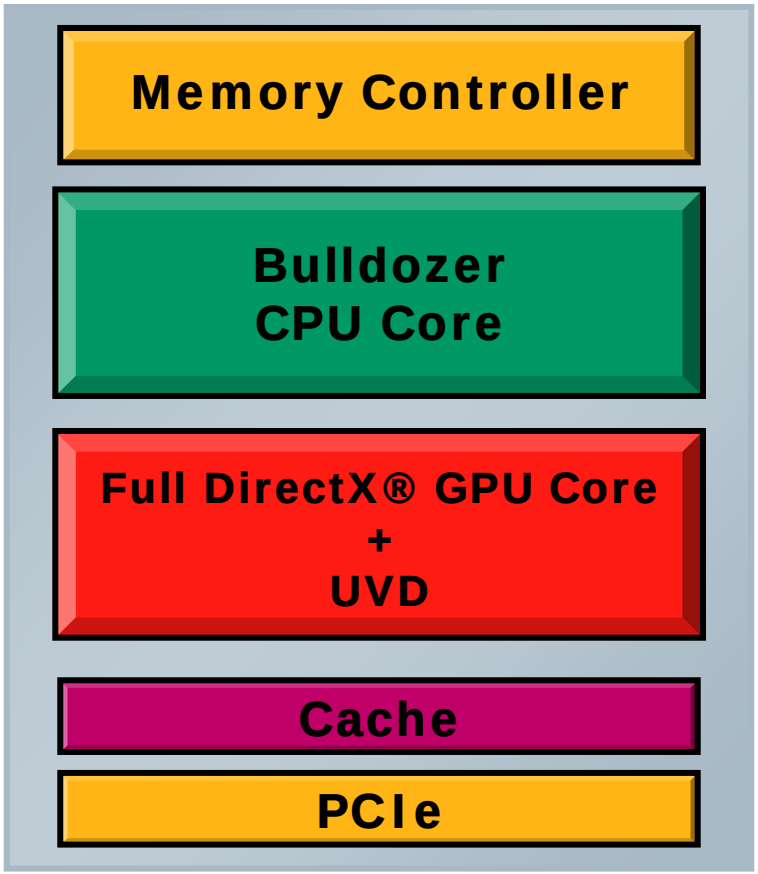
Maximum energy efficiency and uncompromising performance for next-generation mobility

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Solutions

Client Leadership: “Falcon” Fusion Family



Optimized for mobile and mainstream desktops

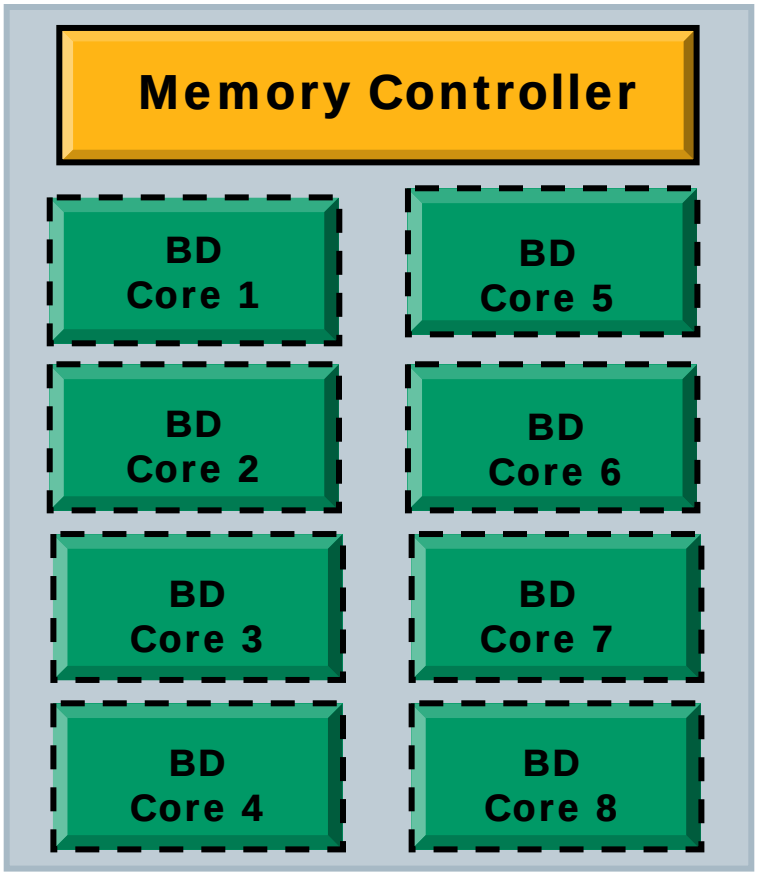
"Bulldozer" CPU cores

Integrated unified shading architecture, DirectX GPU Core

Non-disruptive infrastructure evolution

The first Fusion processor, setting a new standard for client platform innovation

Server Leadership: “Sandtiger” Family



Optimized for servers and high-end clients

8-16 "Bulldozer" (BD) CPU Cores

Highly scalable memory and I/O performance

Non-disruptive infrastructure evolution

Raising the performance-per-watt bar to new heights on single and multithreaded applications



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Bob Drebin
Chief Technology Officer, Graphics Products Group,
Visual and Media Businesses

July 26, 2007

The Future of Discrete Graphics

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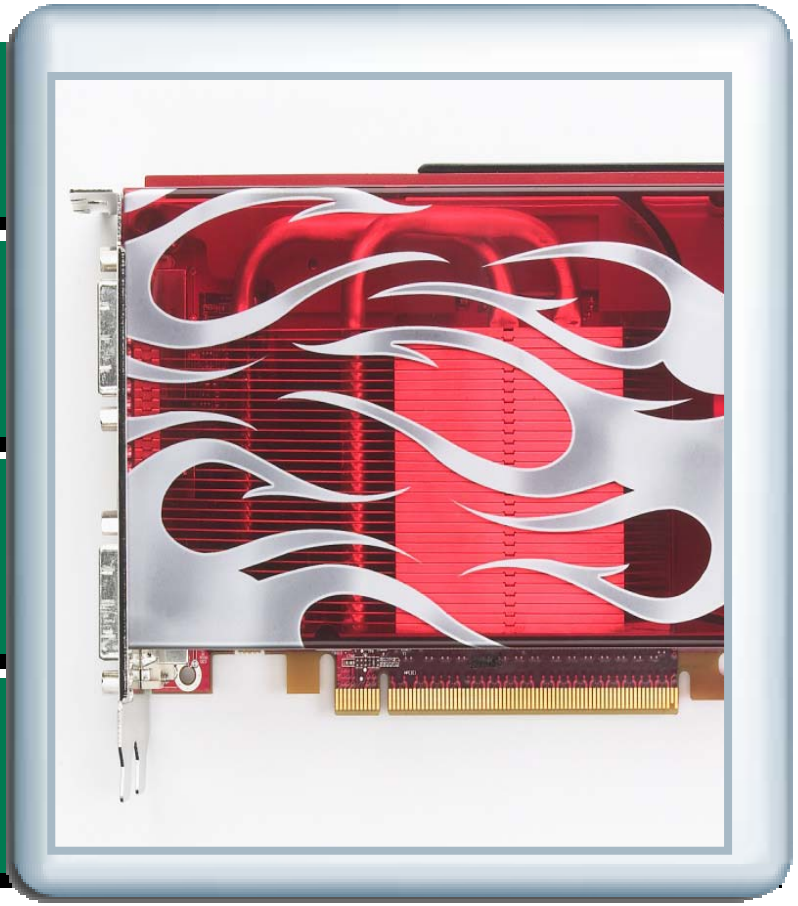
- Discrete GPU lines continue – even in the post-Fusion era
- Discrete still tops for memory bandwidth and graphics compute
- Screen resolution and graphics computation increasing
- Scalable range of graphics solutions from incremental to enthusiast level



Demand for performance graphics processing will continue to be met by discrete solutions

GPU Technology Directions

- **Increasing Parallelism**
 - graphics-centric applications continue to scale
- **Richer Programming Model**
 - new data types, precision
 - better data sharing
- **Architecting for Power**
 - most performance for a power threshold
 - minimizing power for battery scenarios
- **Special Purpose Logic**
 - best power & performance for certain graphics and media functions



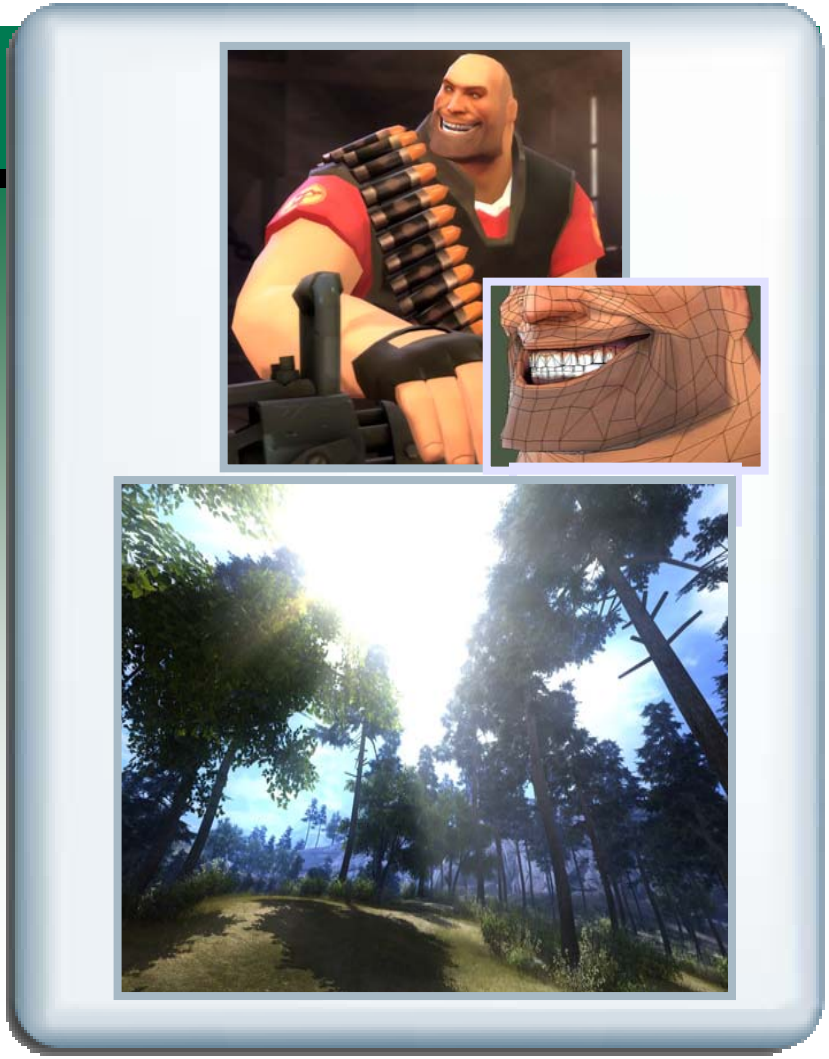
Graphics performance is more than just FLOPS

GPU Usage Directions

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Game Computing

- Not just realistic looking, but realistic behavior
 - Muscle-based animation
 - Physical simulation
- Increasing camera effects
 - Depth of field, motion blur
 - High Dynamic Range effects
- More detail
 - Higher resolution, streaming textures
 - More geometric density
- User interface processing



GPU Usage Directions

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Media Processing

- Longer battery life
- Improved rendering quality
 - Wider filters
 - Temporal and directional filters

Display

- DisplayPort: new display standard
- Increasing panel resolution, frequency, and fidelity



GPU Usage Directions

Enhanced Desktop Experience

- Better text rendering
- More GPU accelerated apps
- Multi-application responsiveness



Stream Computing Futures
Taking HPC technology mainstream

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Highest Compute per mm^2, dollar, & watt

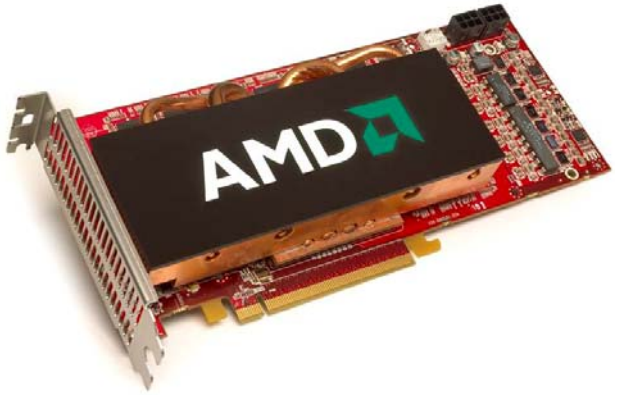
- Performance & bandwidth for HPC applications

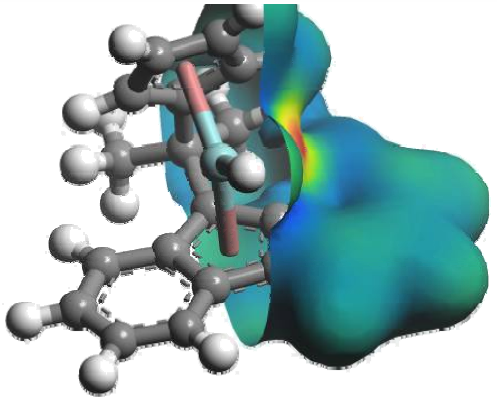
Personal Stream Computing

- Image, video and data intensive processing
- Image/feature search

Programming model standardization

- Whole platform not just GPU-centric





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The Software Story

Software-level Acceleration

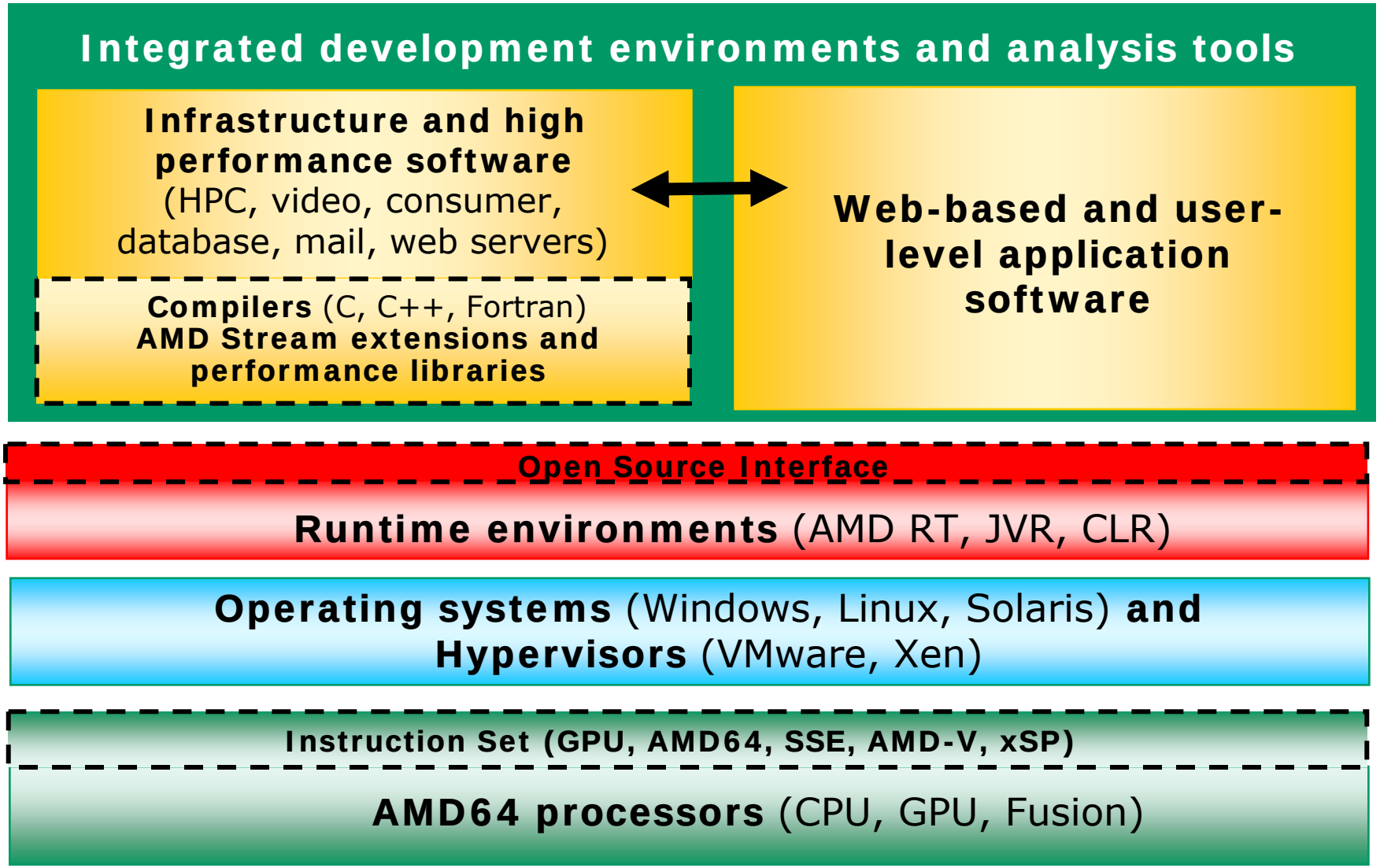
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Hardware is only half the story

Open software eco-system necessary for creating rich development environment and tools

AMD accelerated computing software stack

Accelerated Computing Software Stack



Easing and Accelerating the Parallel Software / Hardware Evolution

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Hardware extensions for software parallelism (xSP)

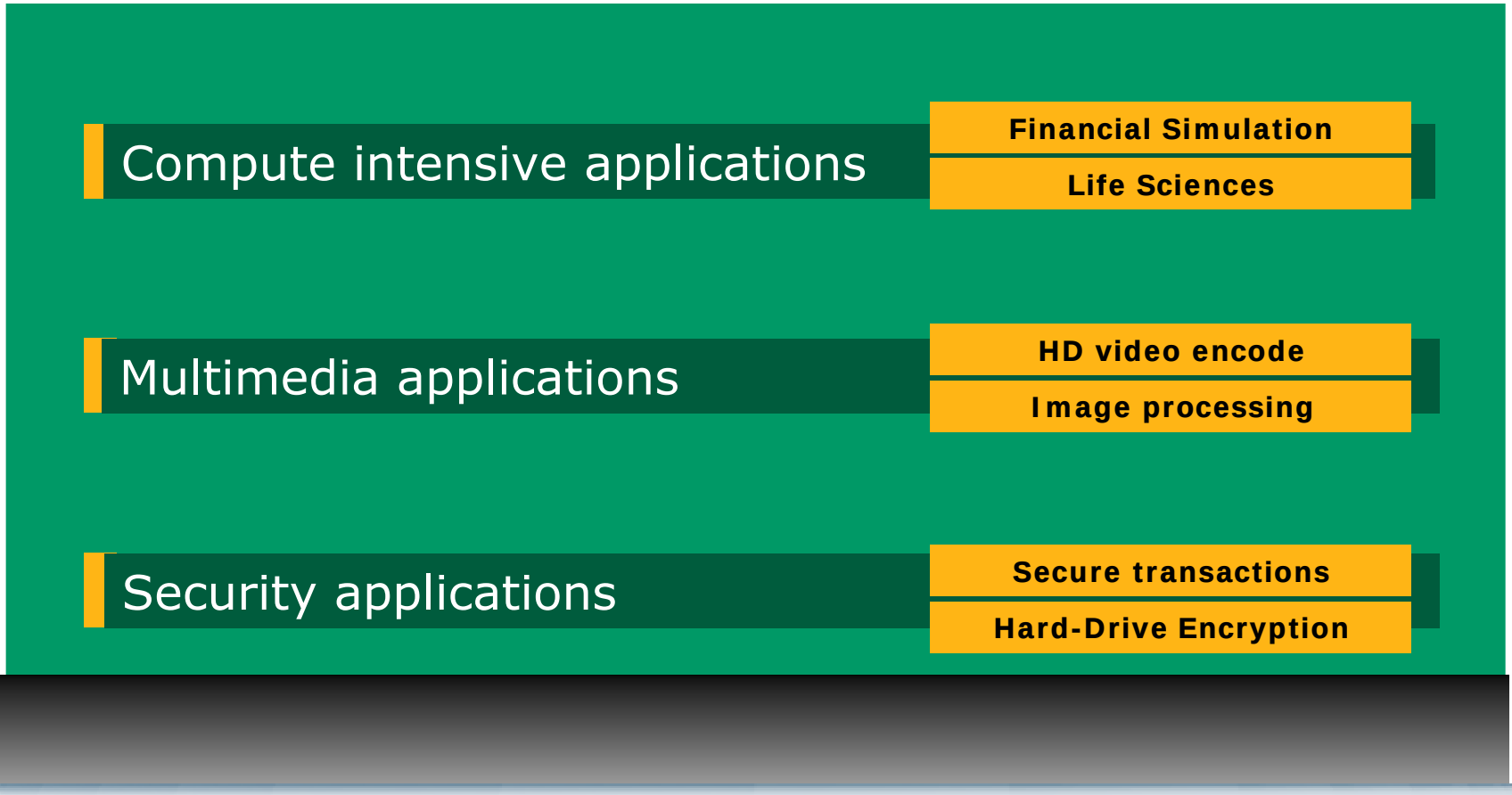
- Acceleration for software transactional memory
- Fast context switching for light-weight parallelism
- Accelerated cross-core communication
- Light-Weight Profiling



Open collaboration to enable a more productive parallel programming environment

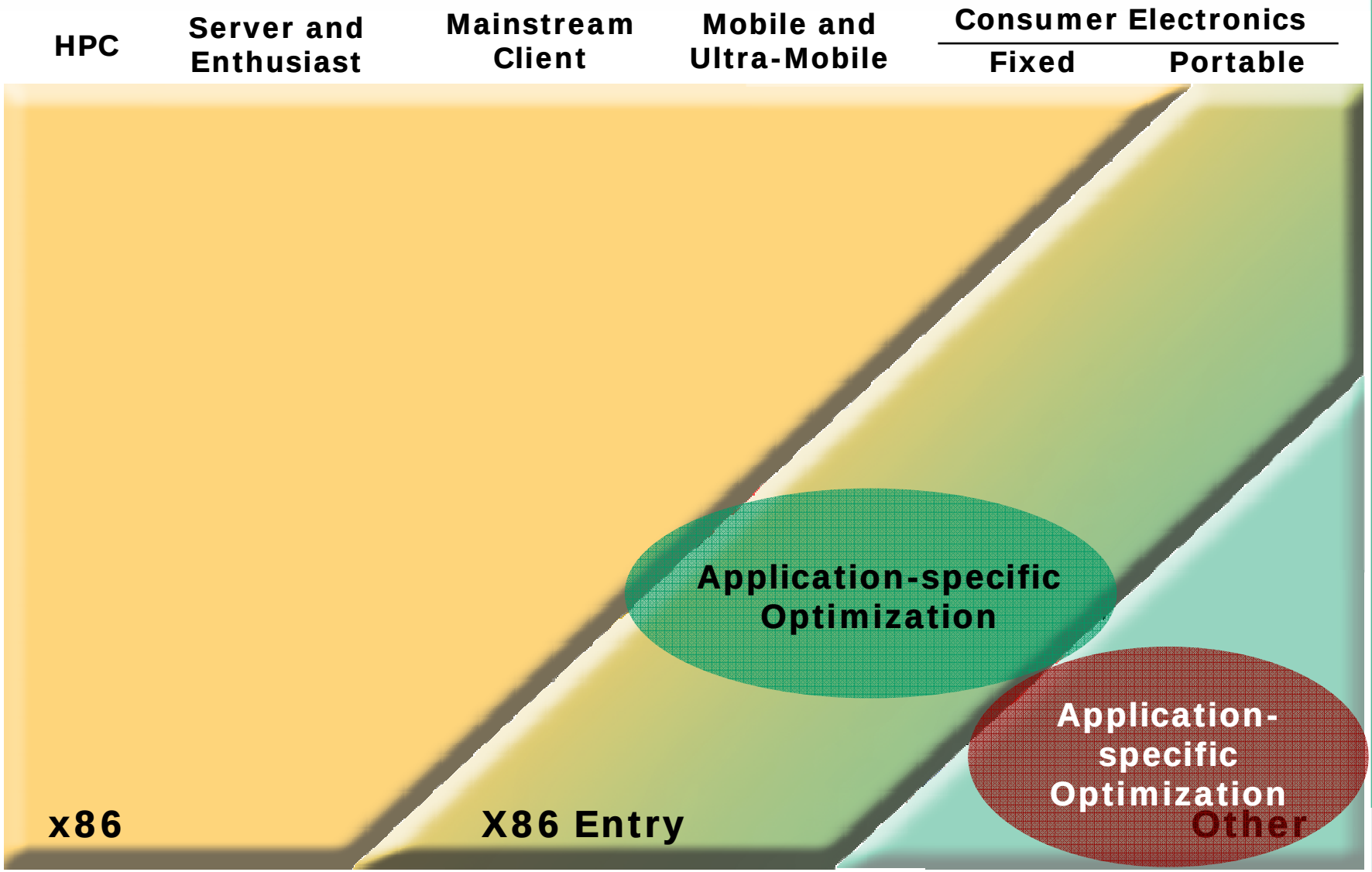
New Instructions Targeting the Most Performance Hungry Workloads

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Enabling increased performance, security, and efficiency through instruction-level acceleration

Diversifying Platform Design Tracks



The Leader in Delivering The Ultimate Visual Experience™ For End Users

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XILLEON™ IMAGEON™



Patented Unified Shader Architecture

Microsoft XBOX360
Nintendo Wii



JVC
Mitsubishi
Samsung
Sharp
Sony
Westinghouse

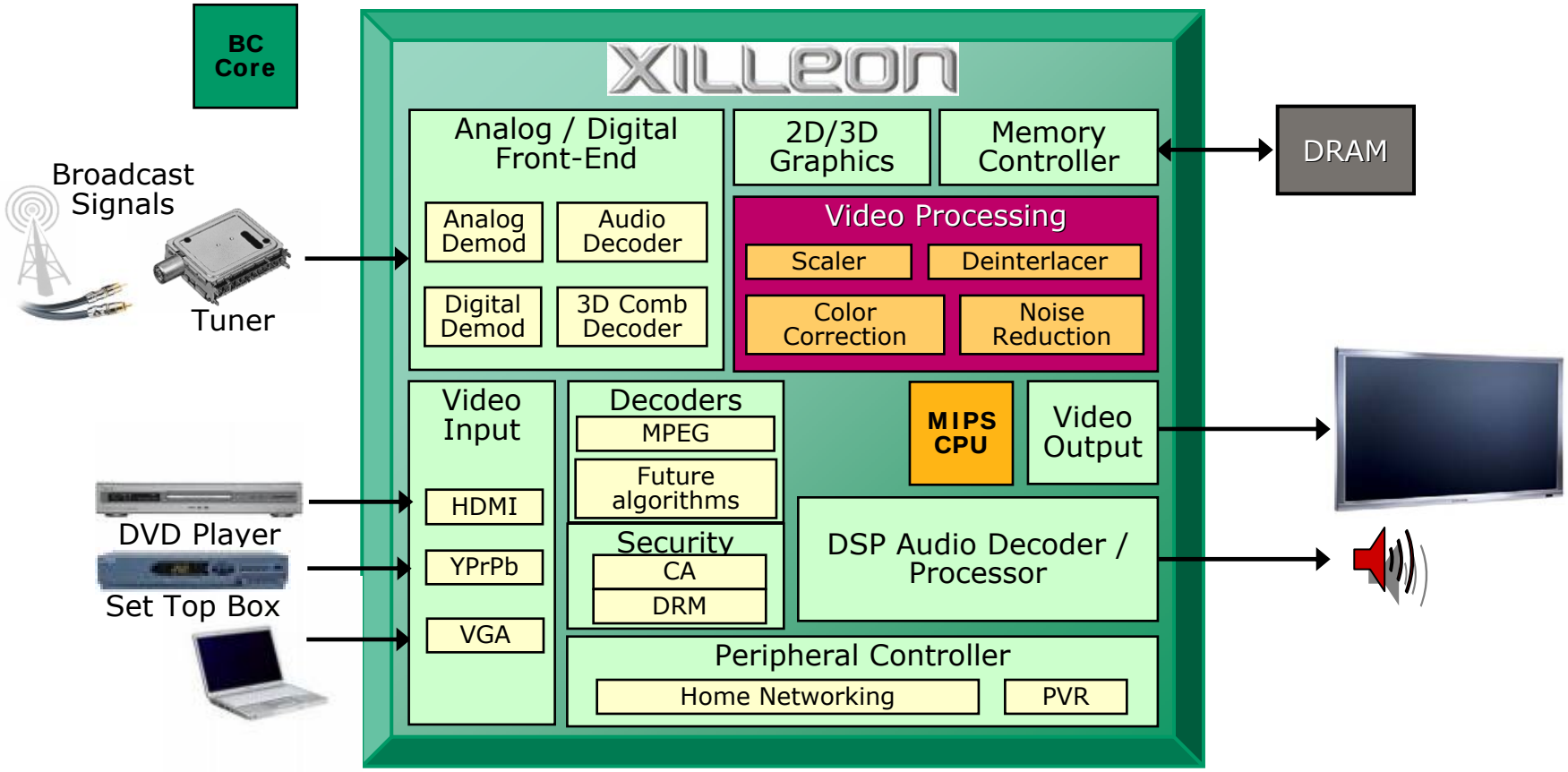


Over 200 Million Processors Shipped

G
otorola
Nokia
Panasonic
Samsung

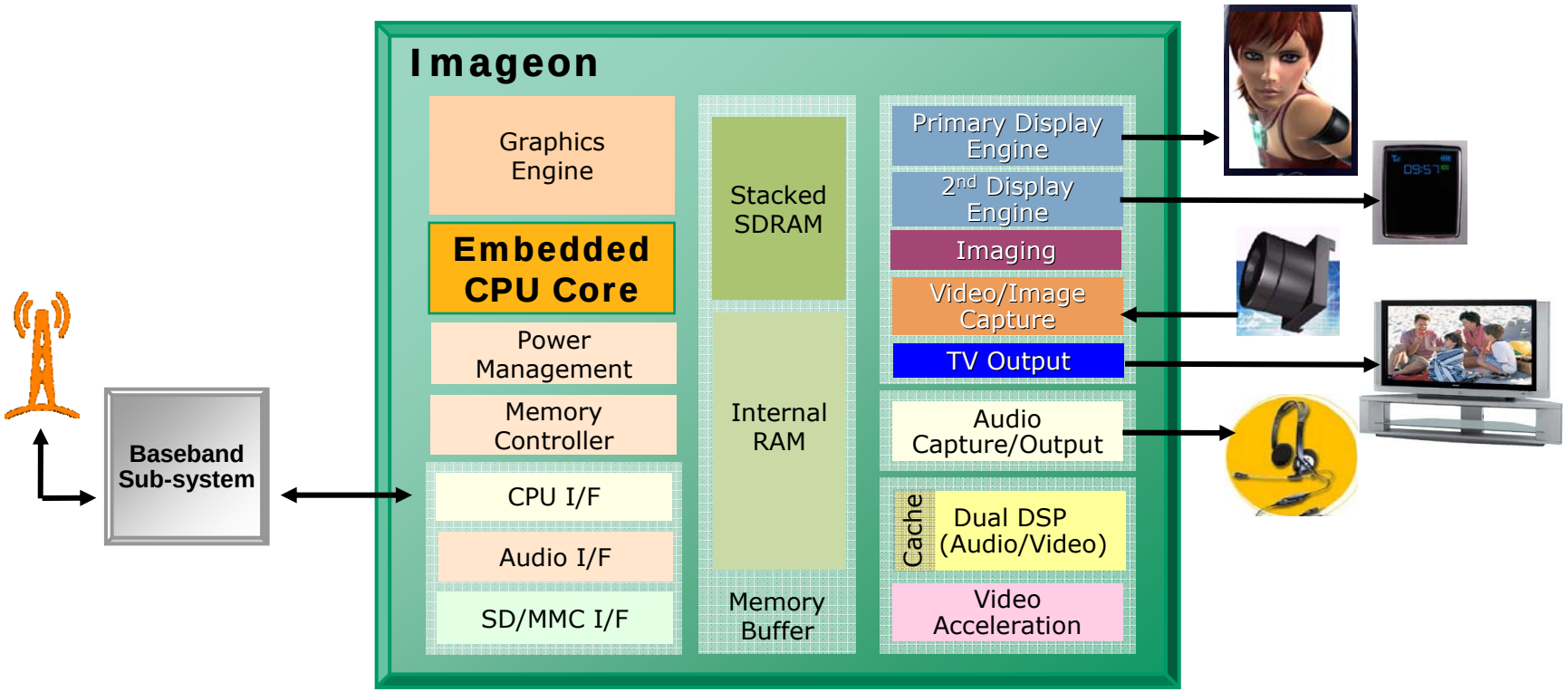
Clear, continuing leadership in consumer electronics visual processing

AMD Xilleon™: DTV and Set-top Box Leadership Now and in the Future



Unmatched image quality, combined with flexibility to provide MIPS *and* x86

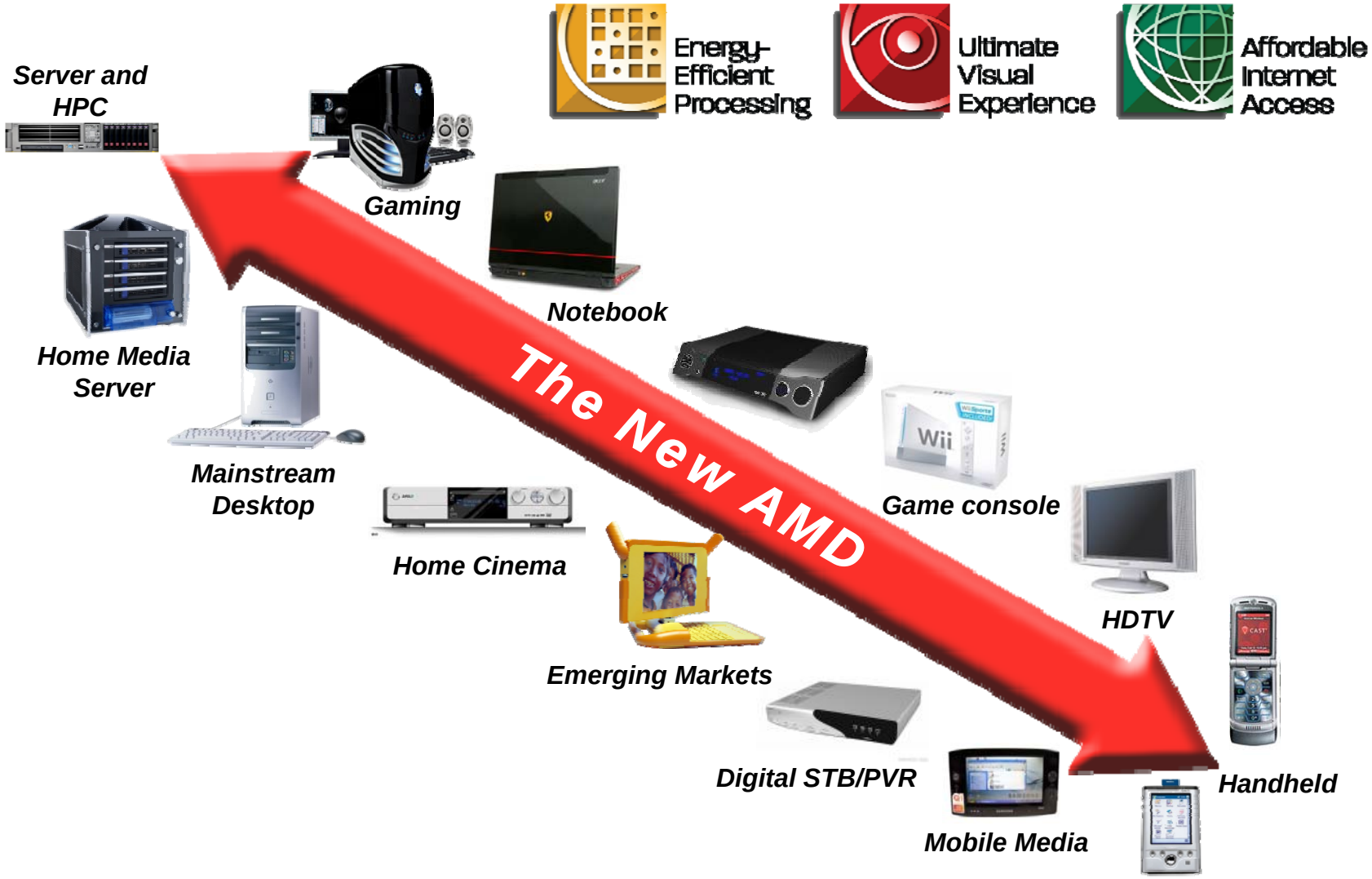
Imageon™ Media Processors



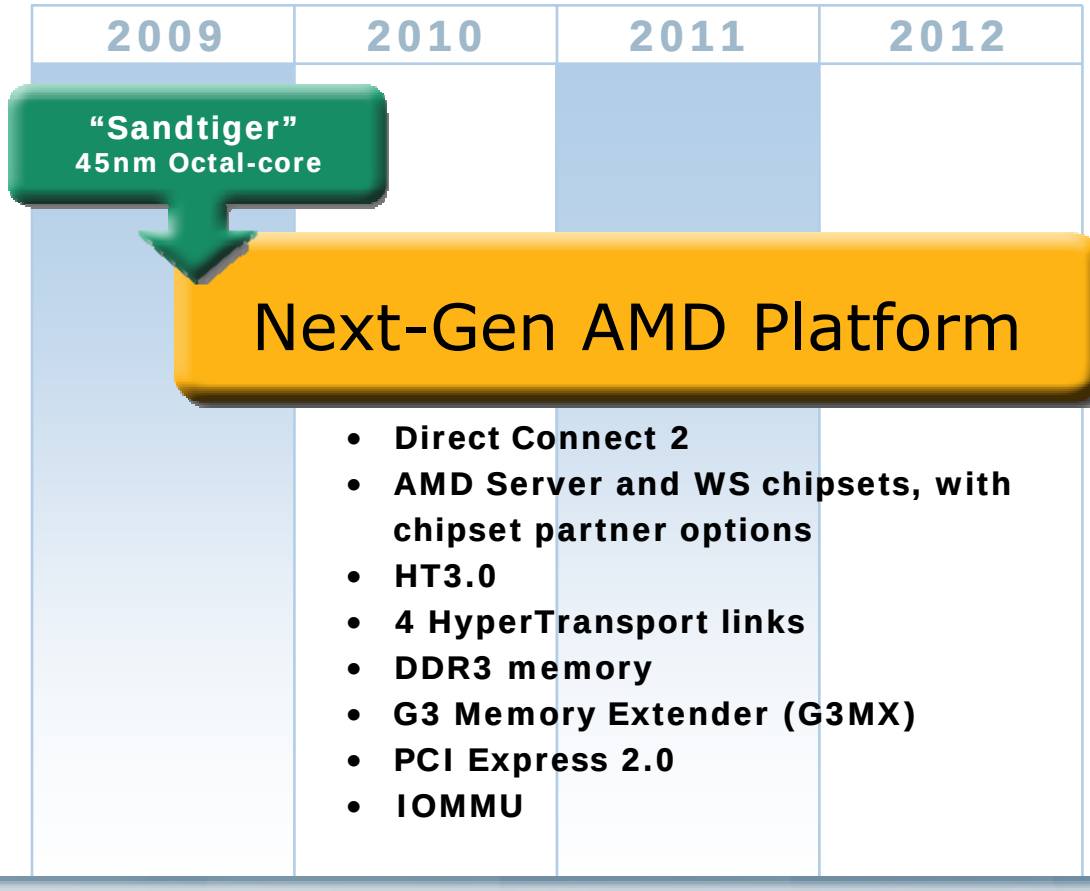
Leading visual quality for high-definition content spanning handhelds to flatscreens

The New Computing Spectrum: All the Screens in Your Life

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AMD Server and Workstation Platforms 2009



Stable platforms deliver better long-term value and logical transitions for partners and customers

AMD Desktop Performance Platform Roadmap: 2007-2009 (Planned)

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Desktop

Platform Segment	2007	2008	2009
	Spider	**Leo**	**Python**
CPU	AMD Phenom X4, X2 2MB L3, HT1.0 EVP, Cool'n'Quiet Technology DDR2, AM2+ Package 65nm	AMD Phenom X4, X2 6MB L3, HT3.0,EVP Cool'n'Quiet Technology, DDR2, AM2+ Package 45nm	Native Octal Core DDR3, AM3 Package 45nm
Chipset	RD7XX Series CrossFire 2X PCI-E Gen II, HT3.0	RD8XX Series CrossFire 2X- 4X GPUs PCI-E Gen II HT3.0	RD9XX
GPU	ATI Radeon HD 2900 GDDR3/GDDR4, DX10	R7XX Series DX 10+ 55nm	Next Generation GPU
Platform	DDR2, HT1.0 Discrete or Integrated Standard & Performance Power	DDR2, HT3.0 Discrete or Integrated Standard & Performance Power	DDR3, HT3.0 Integrated Graphics Standard & Performance Power

AMD Desktop Mainstream Platform Roadmap: 2007-2009 (Planned)

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Platform Segment	2007	2008	2009
	Pinwheel	**Cartwheel**	**Copperhead**
Desktop – CPU	AMD Athlon X2 Processor 1MB L2, HT1.0 EVP, Cool'n'Quiet Technology AM2+ Package 65nm	AMD Athlon X2 Processor 1MB L3, HT3.0 EVP, Cool'n'Quiet Technology 45nm	Native Quad Core DDR3, Fusion Package 45nm
Desktop – Chipset	AMD 690 Chipset DX9, ATI Avivo, DVI/HDMI, PCIe Gen 1	AMD RS700 Series PCI-E Gen II DX10, HT3.0 UVD, Avivo HD	SB8XX
Desktop – GPU	ATI Radeon HD 2000 Series DX 10, UVD ATI Avivo HD, ATI CrossFire	R7XX: DX 10+, UVD PCIe Gen 2 55nm	Next Generation GPU
Desktop – Platform	DDR2 HT1.0 Discrete or Integrated EE & Standard Power	DDR2 HT3.0 Discrete or Integrated EE & Standard Power	DDR3 HT3.0 Integrated Fusion Graphics EE & Standard Power

AMD Notebook Platform Roadmap: 2007-2009 (Planned)

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Mobile

Platform Segment	2007	2008	2009
	Kite Refresh	**Puma**	**Eagle**
CPU	AMD Turion 64 X2: Dual-Core, 1MB Total Dedicated L2, DDR2 Memory Controller, HT 1.0, Digital Media Xpress, AMD-V, EVP	Griffin: Dual-Core, 2MB Total Dedicated L2, DDR2 Memory Controller, Split Power Planes, Dynamic Performance Scaling, Power-Optimized HT 3.0,	Falcon Dual & Quad-Core Full Direct X GPU Core UVD
Chipset	AMD M690 & SB600: DX9, ATI Avivo, ATI PowerPlay, DVI/HDMI, Display Cache, HT 1.0, PCIe Gen 1	RS780M & SB700: DX10, UVD, ATI Avivo, ATI PowerPlay, DVI / HDMI / DisplayPort, Display Cache, HT 3.0, PCIe Gen 2, HyperFlash	Fusion Southbridge
GPU	ATI Mobility Radeon HD 2400/2600 Series: DX 10, UVD, ATI Avivo HD, ATI PowerPlay	M8X: DX 10+, UVD 55nm	Next-generation mobile GPU
Platform Infrastructure	PowerXpress, Hybrid Hard Disk Drives, WLAN: 802.11 a/b/g/draft n, WWAN: 3G, ASF 2.0, TPM	PowerXpress, Hybrid Hard Disk Drives, WLAN: 802.11 a/b/g/n, WWAN: 3G, DASH, TPM	PowerXpress, Hybrid Hard Disk Drives, WLAN: 802.11 a/b/g/n, WWAN: 3G, DASH, TPM

AMD Imageon Handheld Technology Roadmap 2007-2009 (Planned)

Handheld

Platform Technologies	2007	2008/09
Display	WQVGA / WVGA	WVGA/SVGA / XVGA
Graphics	3D S/W & OGL ES 1.1+	OpenVG / OGL ES 2.1
Camera & Video	3MPix CIF MPEG4	5MPix w/ISP 12+MPix w/ISP D1 H.264
Audio	AMR/MIDI MP3/AAC/AAC+	AEC / 3D Audio Voice recognition
Mobile TV	MPEG4/H.264 DVB-H	ISDB-T/DMB Multi-mode

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